Remarks

The present invention is a humidifier in a gas supply apparatus for a polymer electrolyte fuel system comprising an inlet pipe through which reactant gasses are supplied from a reactant gas reservoir, a reactant gas flux regulator for adjusting a flow rate of supplied reactant gasses, a reactant gas supply pipe for supplying humidified reactant gasses to a fuel cell, a pressure regulator for adjusting pressure of reactant gasses inside the fuel cell, a coolant regulator for cooling the fuel cell, a fuel cell temperature regulator for adjusting temperature of the fuel cell, and a humidifier for humidifying the reactant gasses for a polymer electrolyte fuel system. The humidifier comprises in an embodiment of the invention a humidification vessel 20 to which is connected a reactant gas inlet pipe 24 for supplying reactant gas thereto, a water inlet pipe 30 for supplying water thereto, and a reactant gas supply pipe 24 for supplying the humidified reactant gasses to the fuel cell; and a sprayer 26, which is installed in the humidification vessel, for spraying the reactant gasses and water supplied to the humidification vessel.

The drawings stand objected to regarding informalities noted in sections 1 and 2 of the Office Action. The Specification has been amended to correlate the reference numbers used in the drawings with the Specification.

The Specification has been amended to improve its form for reexamination including the informalities noted by the Examiner.

Fig. 1 has been amended to replace reference numeral "55" with "5" as marked in red. Replacement drawings are attached hereto.

Claims 1-8 stand objected to regarding informalities. With respect to the Examiner's point pertaining to the preambles being inconsistent, it should be noted that the scope of the subject matter claimed in claim 1 is "said humidifier

comprising." Therefore, the recitation of 'the humidifier' in the preambles of the dependent claims is submitted to be proper and consistent with the subject matter which is covered by claim 1 since the preamble of claim 1 sets the environment in which the humidifier is construed to be present.

Claims 1-3 and 7-8 stand rejected under 35 USC §103 as being unpatentable over the admitted prior art of Figures 1 and 2 and USP 6,699,608 (Blaszczyk et al). These grounds of rejection are traversed with respect to corresponding newly submitted claims 9-11 and 12-13 for the following reasons.

With respect to claim 1 the Examiner reasons that the applicant's admitted prior art Figures 1 and 2 do not disclose a water inlet pipe or a spray. The Examiner reasons that Figure 1 of Blaszczyk et al (*supra*) disclose a water pipe 5 for supplying water thereto in a spray which is installed in the humidification vessel and finely sprays the reactant gas and water supplied to the humidification vessel. However, it is submitted that the Examiner has erroneously construed the teachings of Blaszczyk et al to disclose spraying of both reactant gas and water.

In fact, in Blaszczyk et al water is sprayed into a stream of reactant gas flowing in the spraying chamber 2 which forms the gas feed line. See column 2, lines 50-63. What is clearly disclosed is that the process gas 7 is fed to the humidifier 1 through a process gas inlet 8 in the region of the spray chamber 2. However, spray nozzles 6 in the spray chamber are disclosed as forming a large number of droplets but it is clear that their feed is only water as clearly illustrated by the legend identifying the inlet to pipes 5 as "H_2O". Accordingly, it is submitted that claim 1 and corresponding claim 9 are not anticipated in view of the conjunctive limitation that the sprayer is recited as "installed in the humidification vessel, for spraying the reactant gas and water supply to the humidification vessel."

Moreover, there is no basis in the record why a person of ordinary skill in the art would be led to modify the teachings of the admitted prior art and Blaszczyk et al to utilize the dual spraying of reactant gas and water as recited in the claims.

Claims 4-6 stand rejected under 35 USC §103 as being unpatentable over the applicants' submitted art further in view of Blaszczyk et al, further in view of USP 5,792,390 (Marino). These grounds of rejection are traversed for the following reasons.

Marino has been cited for teaching a water storage tank, a valve and a water flux regulator which does not cure deficiencies noted above with respect to the admitted prior art and Blaszczyk et al.

Moreover, claim 9 further recites a pressure regulator and fuel cell temperature regulator which are submitted to have no counterpart in Blaszczyk et al. Even though such structures are disclosed in applicants' submitted prior art, it is submitted that a person of ordinary skill in the art would not be motivated to make the proposed combinations set forth by the Examiner including the combination of spraying water and reactant gasses and the aforementioned pressure and temperature regulation.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application are in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the

filing of this paper, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Dep. Acct. No. 01-2135 (1147.40966X00), and please credit any excess fees to such deposit account.

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP

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DES/dks
703-312-6600
Enclosures: 1) Substitute Specification
2) Marked-up Version Showing Changes Made,
3) Replacement Drawing Sheet (Figs. 1 and 2)
4) Annotated Drawing Sheet (Figs. 1 and 2) Showing Changes Made

AMENDMENTS TO THE DRAWINGS

Please replace drawing sheet [0011] including Figs. 1 and 2 with the amended sheet attached hereto. An annotated sheet showing the change made is also attached.

Fig. 1

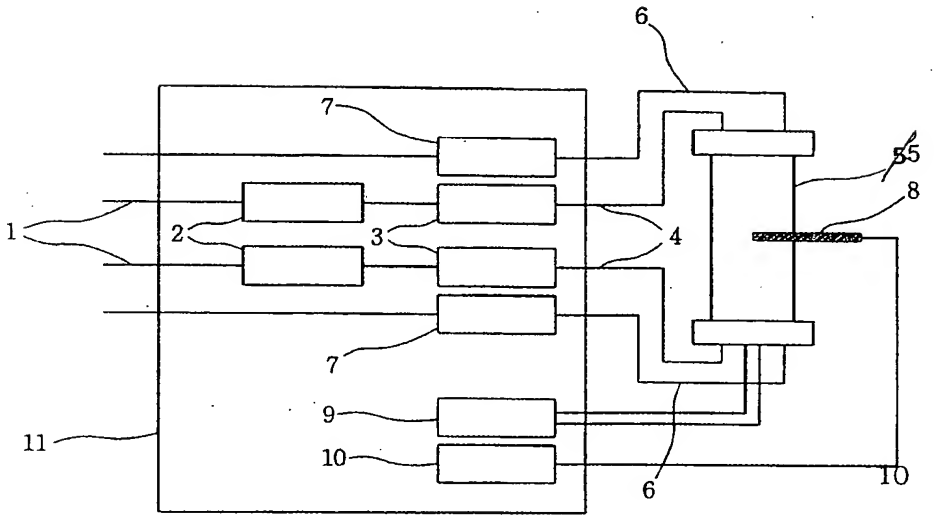

Fig. 2

Prior Art